

KOLB ROAD EXTENSION STUDY

City of Tucson - Department of Transportation

Parsons Brinckerhoff
Quade & Douglas, Inc.

Wheat &
Associates

Rillito
Consulting Group

ENVIRONMENTAL, DESIGN and MITIGATION REPORT

executive summary



KOLB ROAD EXTENSION STUDY

City of Tucson - Department of Transportation

Parsons Brinckerhoff
Quade & Douglas, Inc.

Wheat &
Associates

Rillito
Consulting Group

ENVIRONMENTAL, DESIGN and MITIGATION REPORT

this document has been produced on recycled paper

EXECUTIVE SUMMARY

INTRODUCTION

Following acceptance of the Advanced Planning Report (APR) by Mayor and Council, preparation of an Environmental, Design, and Mitigation Report (ED&MR) was authorized for the Kolb Road Extension project. The ED&MR complies with the requirements of the City of Tucson Roadway Development Policies that were adopted by the Mayor and Council on November 24, 1986. The purpose of the ED&MR is to document the configuration of the roadway improvements, environmental impacts, and the mitigation strategies within the study corridor.

The ED&MR further investigates three selected alternatives that resulted from the completion of the APR.

- Alternative A is the extension of Kolb Road from its intersection with Speedway Boulevard to a proposed grade separation at Tanque Verde and a connection with Sabino Canyon Road. This alternative also requires a bridge crossing at Pantano Wash and where the Kolb Road Extension intersects with existing Kolb Road.
- Alternative B is the construction of three grade-separated intersections (GSIs). The GSIs are located at Sabino Canyon Road and Tanque Verde, Grant-Kolb and Tanque Verde, and Kolb Road and Speedway Boulevard.
- Alternative C is the "Do Nothing" option. This alternative recognizes that there could be some minor street improvements but no construction that would significantly improve the traffic capacity and level of service within the study corridor.

An overall goal for the study, set forth by Mayor and Council, was to prepare a feasible concept design that was environmentally sound and acceptable to the community as a whole. For this reason, the Citizens Advisory Committee (CAC) that was formed for the APR was carried over to the ED&MR portion of the study. The CAC worked with the study team to further identify problem areas and needs within the study corridor. The problem areas and needs are summarized below:

- Existing operations of the intersections in the study area are presently at or near their functional capacity.
- Future traffic volumes at the intersections are projected to be over the intersections' capacities without some type of improvement.

- The north-south travel pattern forces motorists to "dog-leg" around the desired travel path through congested intersections which increases travel distance and has a negative effect on air quality.
- The corridor is identified as a major element in the Pima County Regional Transportation Plan as well as the City of Tucson Major Streets and Routes Plan.
- Multi-modal access to recreational facilities at Udall Park and to proposed improvements along the Pantano Wash (Pantano Wash Linear Park) necessitates some type of facility in the corridor.
- Pima County and City of Tucson public safety agencies have identified a need to improve response time for emergency services to the northeast.

PROJECT PLANNING

Traffic projections were made to estimate the traffic volumes that are expected to occur in the year 2010, which is the year selected by the City of Tucson to govern the planning process. The estimated traffic volumes are derived using the Pima Association of Governments (PAG) traffic model which assumes planned land uses and a transportation network that are forecasted to be in place in the year 2010. The estimated average daily traffic (ADT) for the year 2010 for the two "build" alternatives, the "no build" alternative, and the 1988 "existing" conditions is given below.

Table 2.1
Intersection Total Approach Volumes
Average Daily Traffic (ADT)

<u>Intersection</u>	<u>ADT</u>			
	<u>1988 Existing</u>	<u>2010</u>		
		<u>ALTA</u>	<u>ALTB</u>	<u>ALTC</u>
Sabino Canyon/Tanque Verde	54,000	91,900	85,400	81,000
Grant-Kolb/Tanque Verde	74,000	74,100	94,000	90,000
Speedway/Kolb	<u>65,000</u>	<u>123,700</u>	<u>106,500</u>	<u>102,000</u>
TOTAL	193,000	289,700	283,400	273,000

The volumes shown represent the total volume from all approaches of the intersections. As can be seen from the volumes above, Alternative A is expected to produce higher traffic volumes at the intersections of Sabino Canyon/Tanque Verde and Speedway/Kolb than Alternative B while producing lower traffic volumes at Grant-Kolb/Tanque Verde than Alternative B.

A traffic volume analysis was also prepared to produce estimated peak (PM) hour volumes in 2010 at each intersection for both build alternatives.

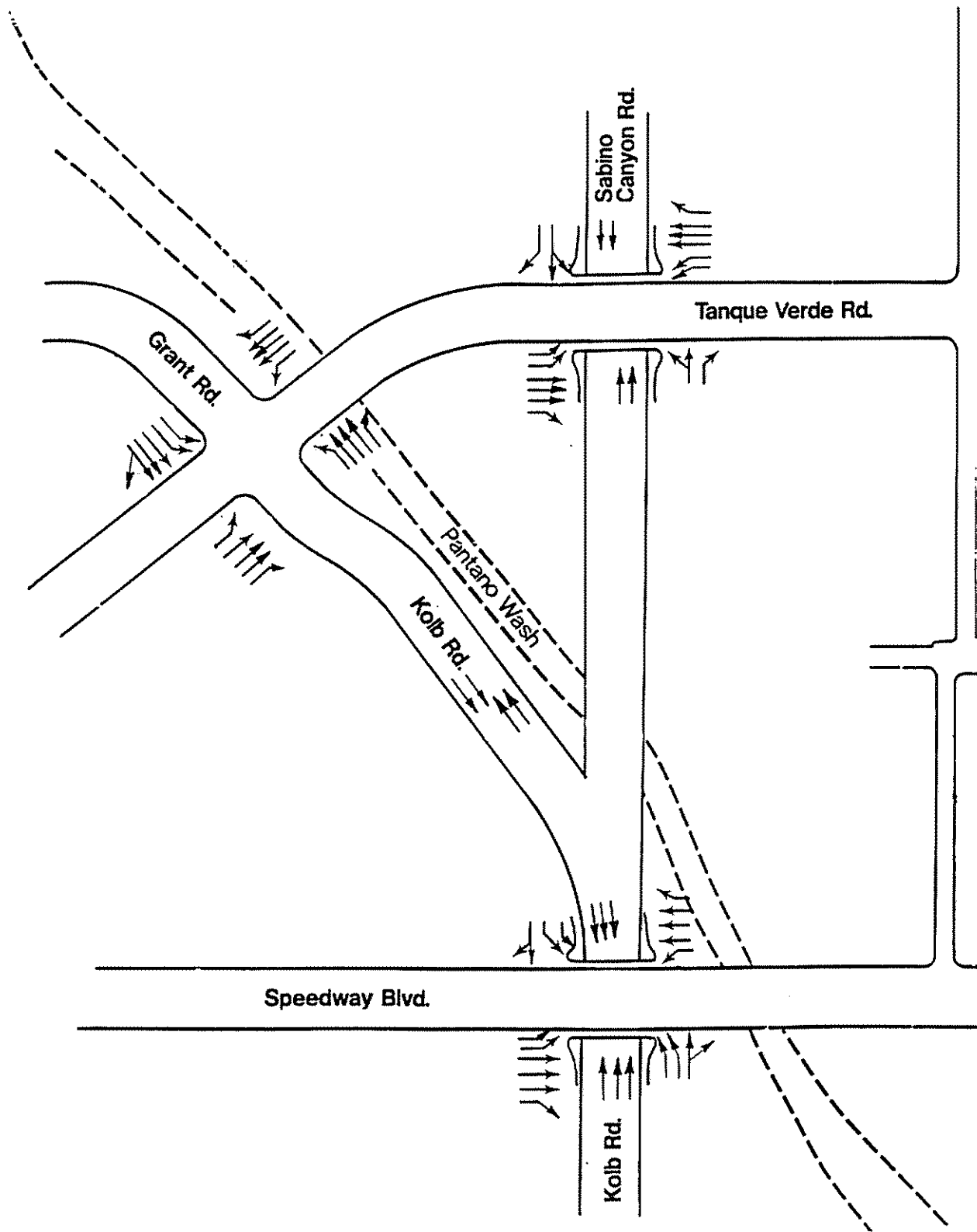
Using the projected traffic volumes and the 1985 Highway Capacity Manual, the number of traffic lanes was determined. The lane requirements for the through roadways and at-grade intersections are shown in Figure 1 for Alternative A and in Figure 2 for Alternative B. It should be noted that bike lanes have been included contiguous with the outside travel lanes on the roadways and will provide bikeway connections between the existing arterials.

Design criteria was established to control the conceptual design. These criteria generally follow the applicable design standards set forth by the American Association of State Highway and Transportation Officials (AASHTO) and the City of Tucson for a 45 miles per hour (MPH) design speed. Bridge design criteria was based on AASHTO and the Arizona Department of Transportation (ADOT) standards.

DESIGN CONCEPT PLANS

Using the goals, objectives, design criteria, and input from the CAC, two preferred "build" alternative design concept plans were prepared that were used to form the basis for the environmental assessment and to identify the mitigation measures that are considered necessary to deal with the project's impacts on the study area's environment.

The design concept plans for Alternative A are shown in Figures 3a-3b. Alternative B is shown in Figures 4a-4c. The salient features of each alternative are summarized below:



KOLB ROAD EXTENSION STUDY

City of Tucson - Department of Transportation

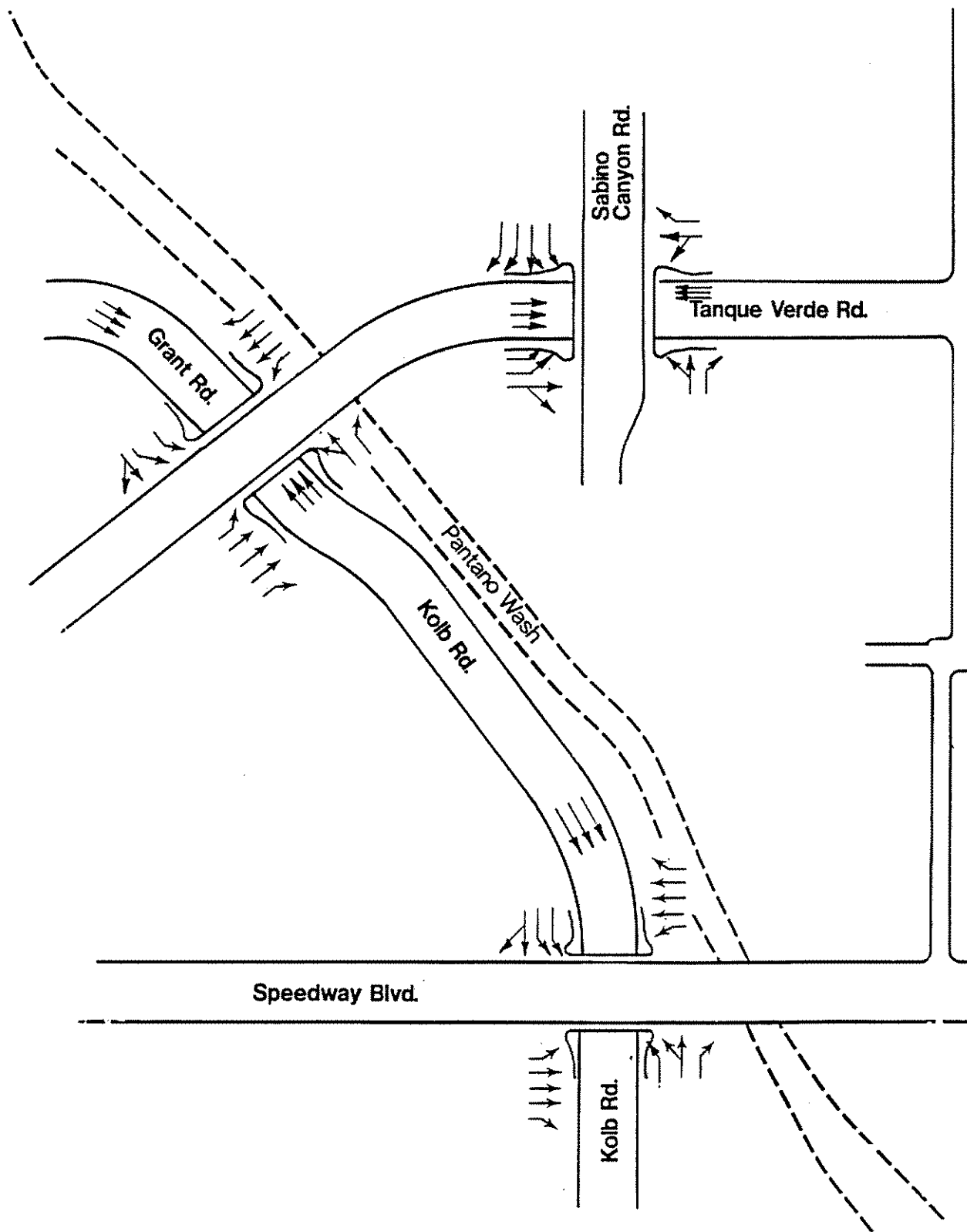
Alternative A
LANE REQUIREMENTS

Parsons Brinckerhoff
Quade & Douglas, Inc.

Wheat &
Associates

Rillito
Consulting Group

FIGURE 1



KOLB ROAD EXTENSION STUDY

City of Tucson - Department of Transportation

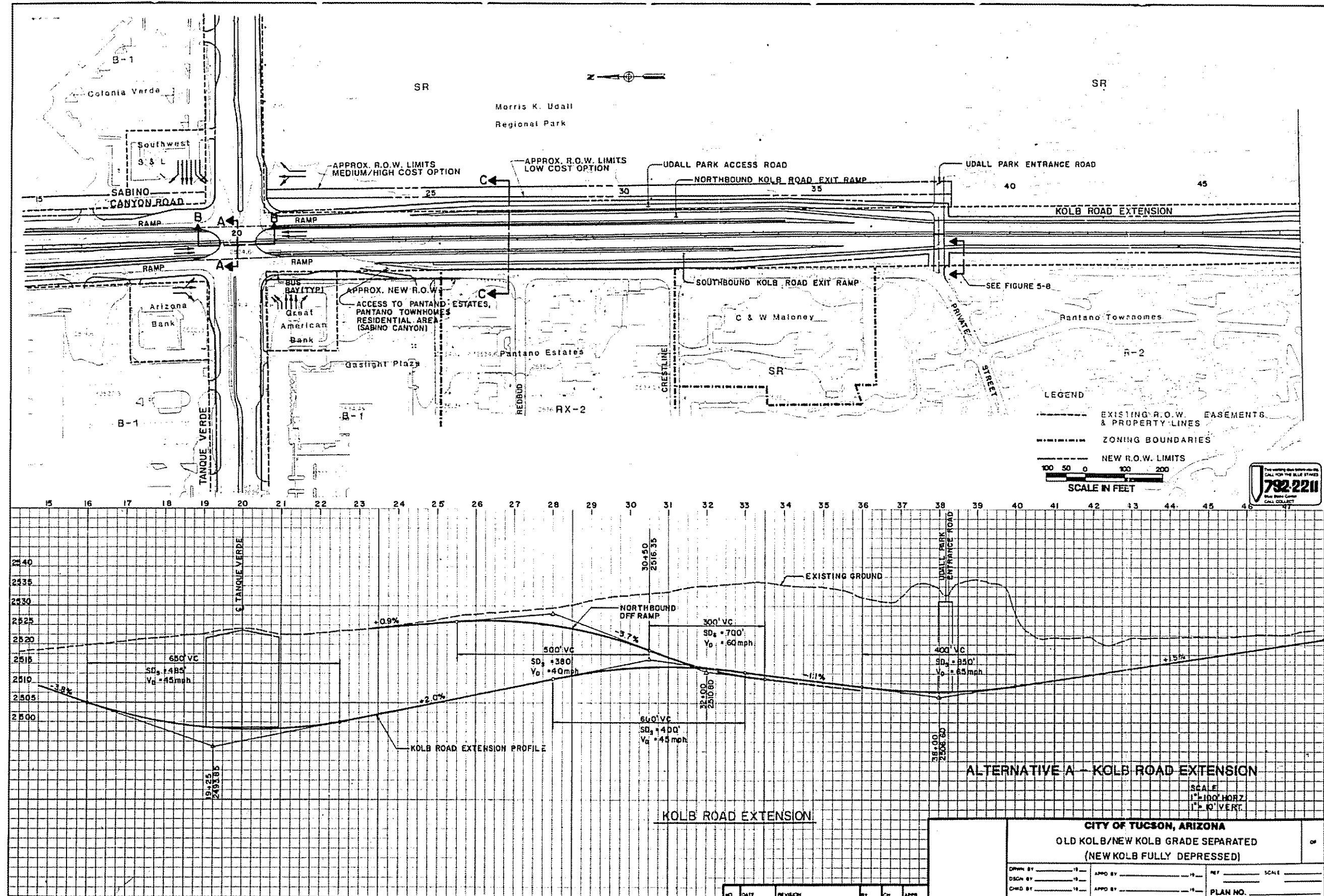
Alternative B
LANE REQUIREMENTS

Parsons Brinckerhoff
Quade & Douglas, Inc.

Wheat &
Associates

Rillito
Consulting Group

FIGURE 2

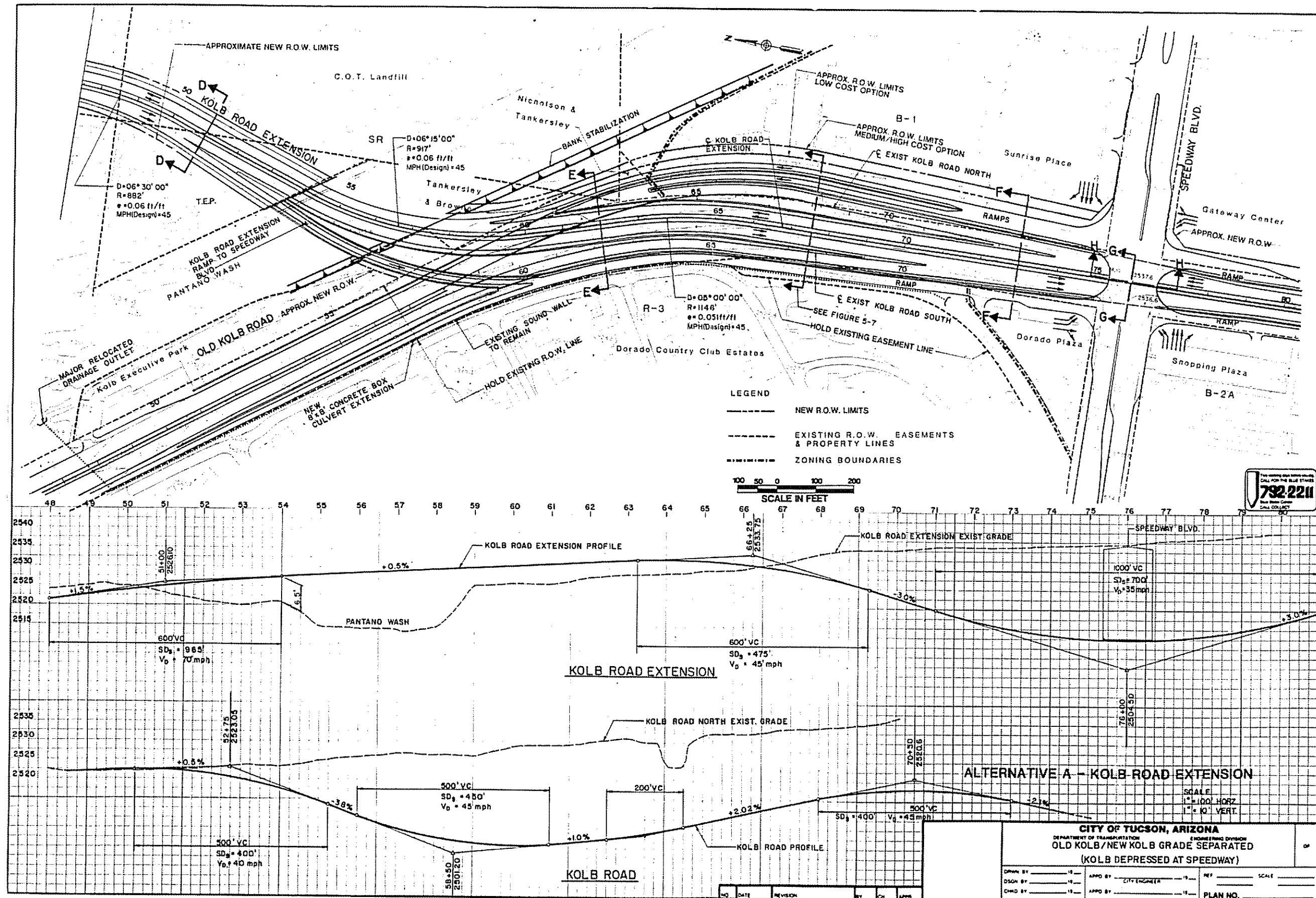


Alternative A
CONCEPT PLAN

FIGURE 3A

**KOLB ROAD
EXTENSION STUDY**
City of Tucson - Department of Transportation

Parsons Brinckerhoff
Quade & Douglas, Inc.
Rillito Consulting Group
Wheat & Associates

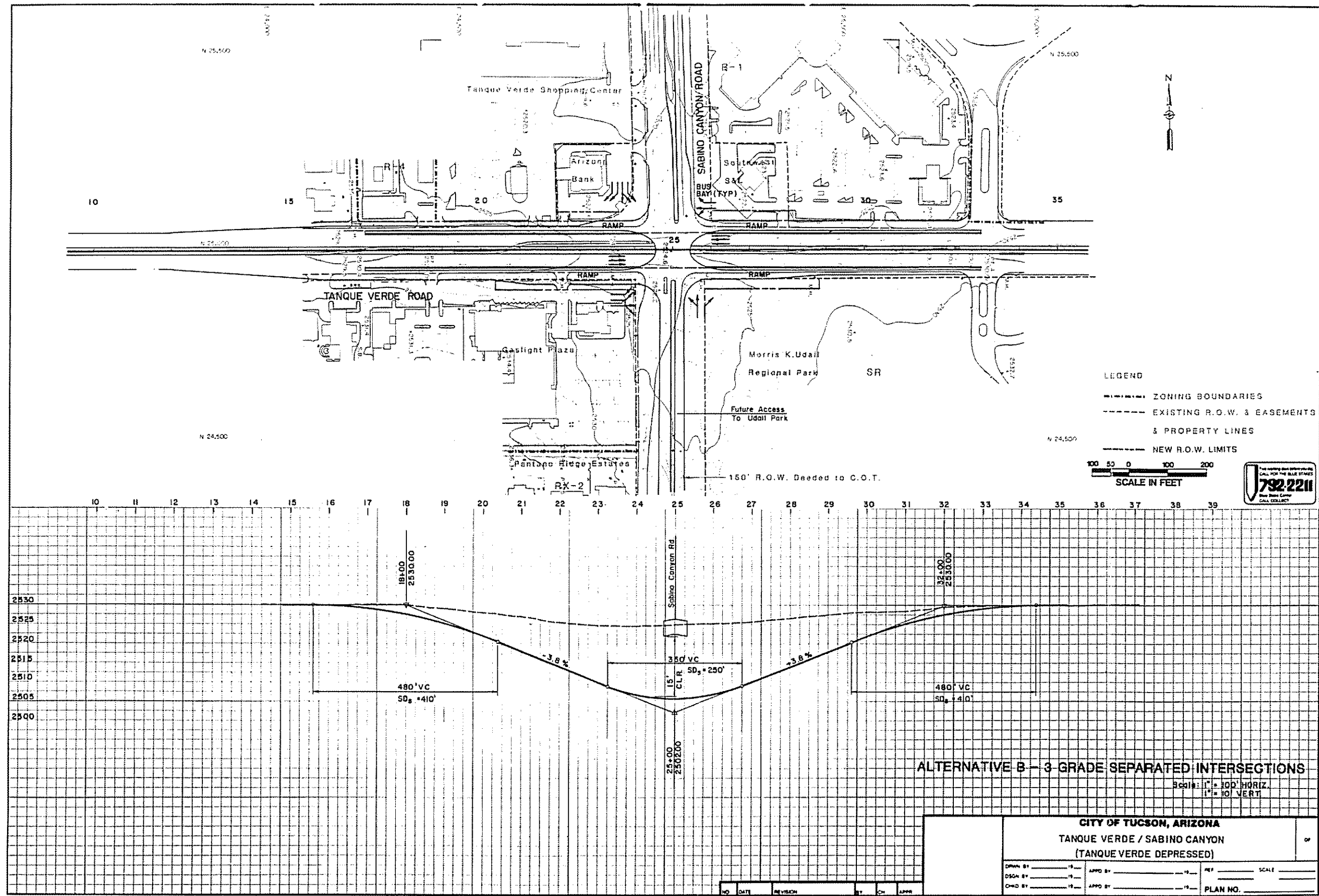


KOLB ROAD EXTENSION STUDY
 City of Tucson - Department of Transportation

Alternative A
CONCEPT PLAN

FIGURE 3B

Parsons Brinckerhoff
 Quade & Douglas, Inc.
 Wilco & Associates
 Rolito Consulting Group

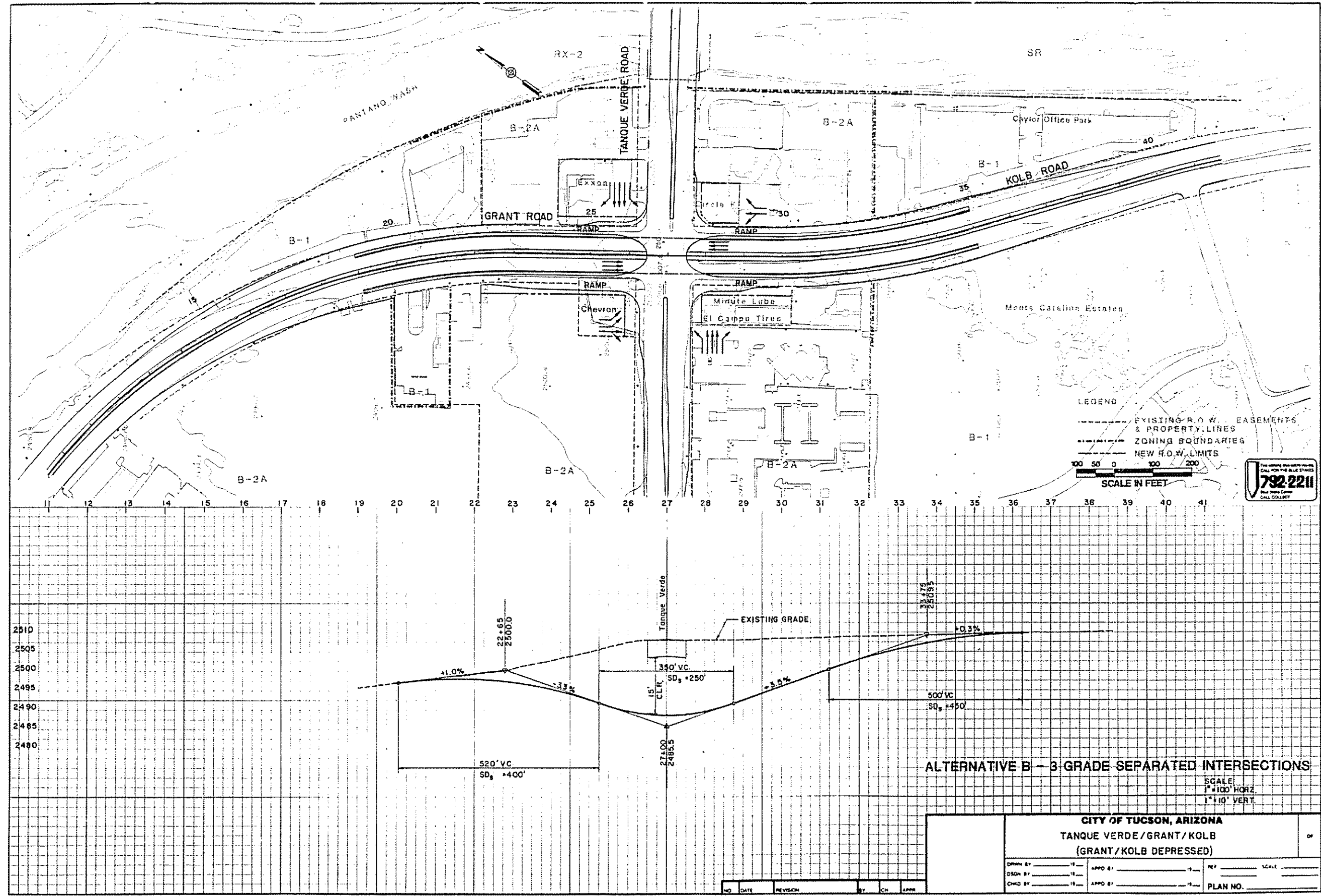


Alternative B
CONCEPT PLAN AT
SABINO CANYON

FIGURE 4A

**KOLB ROAD
EXTENSION STUDY**
City of Tucson - Department of Transportation

Parsons Brinckerhoff
Quade & Douglas, Inc.
Wheel & Associates
Ridito Consulting Group



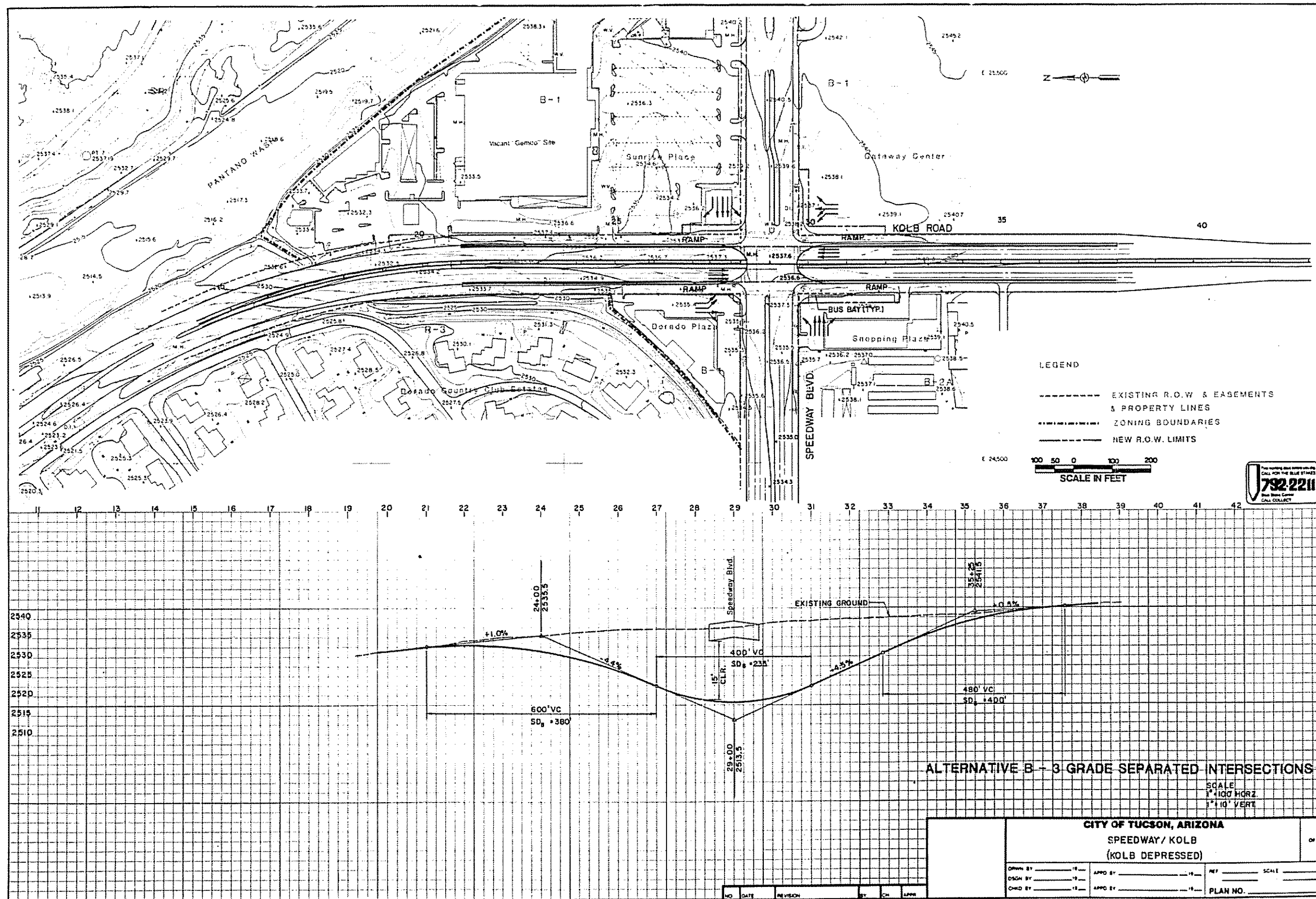
Alternative B
CONCEPT PLAN AT
GRANT-KOLB/TANQUE VERDE

FIGURE 4B

**KOLB ROAD
EXTENSION STUDY**

City of Tucson - Department of Transportation

Parsons Brinckerhoff
Quade & Douglas, Inc.
Wheat & Associates
Rellio Consulting Group



Alternative B
CONCEPT PLAN AT
SPEEDWAY

FIGURE 4C

**KOLB ROAD
EXTENSION STUDY**
City of Tucson - Department of Transportation

Parsons Brinckerhoff
Quade & Douglas, Inc.

Wilcat &
Associates

Rallio
Consulting Group

Alternative A

- A direct limited access roadway that connects existing Kolb Road from south of Speedway Boulevard to Sabino Canyon Road just north of Tanque Verde.
- Bridge over the Pantano Wash.
- Grade separation structures at:
 - Kolb Road and Speedway Boulevard
 - Existing Kolb Road where the Kolb Road Extension will pass over existing Kolb Road.
 - Sabino Canyon-Kolb Road Extension and Tanque Verde
- Access to and from Udall Park from Tanque Verde including a bridge across the proposed Kolb Road Extension.
- Ramps that will provide access to and from Speedway Boulevard to the Kolb Road Extension.
- Ramps that will provide access from Existing Kolb Road to and from the north on the Kolb Road Extension.
- Ramps that will provide access between the Kolb Road Extension/Sabino Canyon Road and Tanque Verde Road.
- Local access provided to businesses and other adjacent properties.
- Provision for the proposed Pantano Wash Linear Park to pass under the Pantano Wash Bridge.
- Soil cement bank protection provided along the south bank of the Pantano Wash.
- Drainage system including pump stations where required.
- Roadway lighting.
- Landscaping along roadways and buffer areas.
- Aesthetic treatment of walls and bridges.
- Relocation of affected utilities.
- Property acquisition including buffer area construction.
- Traffic control facilities; i.e., signals, signs, and pavement markings.
- Bike lanes on selected roadways.
- Sidewalk areas.
- Bus turnout area.

Alternative B

- Grade separation at Sabino Canyon Road and Tanque Verde (Tanque Verde underpasses Sabino Canyon Road).
- Grade separation at Grant-Kolb and Tanque Verde (Grant-Kolb underpasses Tanque Verde).
- Grade separation at Kolb Road and Speedway Boulevard (Kolb underpasses Speedway Boulevard).
- Access to and from Udall Park from Sabino Canyon Road and Tanque Verde.
- Access between each of the roadways involved at the grade-separated intersections by ramps and frontage roads.
- Local access provided to businesses and other adjacent properties.
- Drainage system including pump stations where required.
- Roadway lighting.
- Landscaping along roadways and buffer areas.
- Aesthetic treatment of walls and bridges.
- Relocation of affected utilities.
- Modest property acquisition including buffer areas (narrower than Alternative A).
- Traffic control facilities; i.e., signals, signs, and pavement markings.
- Bike lanes on selected roadways.
- Sidewalk areas.
- Bus turnout areas.

ENVIRONMENTAL ASSESSMENT

An environmental assessment was prepared for the two "build" alternatives (A and B) and the "Do Nothing" alternative (C). Environmental data from the APR and the supplemental data developed during the ED&MR formed the basis for the environmental assessment. The impacts of the alternatives on the environment were assessed for both long-term effects and for those of a temporary nature caused by construction.

The long-term effects are summarized below:

- **Air Quality**

Alternative A: Neither the Arizona nor the National Ambient Air Quality standards would be exceeded with the extension of Kolb Road. Vehicle miles traveled (VMT) would be less than the 1988 model of the Regional Transportation Plan (which includes the Kolb/Speedway and Tanque Verde/Sabino Canyon GSIs), vehicle hours traveled (VHT) would also be less. We anticipate there would be no significant impact on air quality in the study area.

Alternative B: GSIs result in significant improvements in air quality over signalized intersections. Both VMT and VHT are less in Alternative B than the 1988 Regional Transportation Plan, therefore, there would be no significant negative impact on air quality in the study area.

Alternative C: Traffic volumes are estimated to continue to increase in the study area. The existing traffic intersections are approaching their capacity now. Unless improvements are made, queue distances will increase and vehicle emissions will add pollutants to the study area. Both VMT and VHT would be greater than that in the 1988 Regional Transportation Plan.

- **Community Impacts**

1. **Emergency Services**

Alternative A: Will enhance emergency services by providing a direct connection from Kolb Road to Sabino Canyon Road and Tanque Verde. The Pima County Sheriff's Department and the City of Tucson Police Department concur that an additional crossing of the Pantano Wash would be beneficial.

Alternative B: Will somewhat enhance emergency services by providing free flow on underpass roadways and less congestion on overpass roadways at the high volume intersections.

Alternative C: Effectiveness of area emergency services would be diminished because of the resulting decline in area mobility.

2. Neighborhoods

Alternative A: No division of neighborhoods would occur. Access from the Pantano Townhomes neighborhood to Kolb Road could result in local traffic circulation changes in the neighborhood. Grade separations will alter access to local commercial businesses by restricting ingress and egress to right turns only.

Alternative B: No division of neighborhoods would occur. The access to local commercial businesses within the intersection areas would be altered to right turns only.

Alternative C: Local neighborhoods may be affected by traffic using local streets to avoid delays at intersections.

3. Schools

Alternative A: Would improve school bus access. Would not affect student access to schools in the area.

Alternative B: Would not affect student access to schools in the area.

Alternative C: Additional traffic on streets within Green Hills Subdivision could affect students walking to Hudlow Elementary.

4. Utilities

Alternative A: Sanitary sewers, water, natural gas, telephone, electric, cable television, and storm sewer facilities would be disrupted and require relocation.

Alternative B: Same as Alternative A.

Alternative C: Would not affect utilities.

• Consistency with Local Plans

Alternative A: Would be consistent with the Baja Project Plan, the 1981 Master Plan for Morris K. Udall Regional Park, the Comprehensive Plan for the City of Tucson, the City of Tucson Roadway Development Policies (COT Ordinance No. 6593) and the Pantano East Area Plan.

Alternative B: Would be consistent with the goals of the Baja Project, the 1981 Master Plan for Morris K. Udall Regional Park, the Comprehensive Plan for the City of Tucson, and the Pantano East Area Plan. Alternative B would be inconsistent with COT Roadway Development Policies (COT Ordinance No. 6593).

Alternative C: Would be inconsistent with the goals of the Baja Project, the 1981 Master Plan for the Morris K. Udall Regional Park, and the Comprehensive Plan for the City of Tucson. Alternative C would be inconsistent with COT Roadway Development Policies (COT Ordinance No. 6593).

- **Cultural Resources**

1. **Archaeological Resources**

Alternative A: Has a high probability of impacting archaeological resources because of the undisturbed nature of the area involved. One site and four isolated occurrences were encountered in the preliminary evaluation. Archaeological testing would be required.

Alternative B: Little potential for archaeological impacts since area has already been largely disturbed. Archaeological testing would be required.

Alternative C: Would not affect archaeological resources.

2. **Historical Properties**

Alternative A: No apparent historically significant structures involved.

Alternative B: Same as Alternative A.

Alternative C: Would not affect historic structures.

3. **Parklands**

Alternative A: Will affect Udall Park and the proposed Pantano Wash Linear Park. Additional right-of-way will be required from Udall Park for park access from the Kolb Road Extension. Acquisition would be subject to Section 6(f) of the Land and Water Conservation Fund provisions.

The Pantano Wash Linear Park would be affected visually since the project would overpass the trails to be located on the east bank.

Alternative B: The construction of the grade separated intersection at the Sabino Canyon/Kolb Road and Tanque Verde intersection would affect Udall Park.

Alternative C: Traffic will continue to be a major problem for ingress and egress at Udall Park.

- **Ecologically Sensitive Areas**

Alternative A: Would have some impact on a small undeveloped area which provides a habitat for native wildlife, however, other development; i.e., Udall Park, a residential area, and the Pantano Wash Linear Park is diminishing the value of the habitat. Mitigation can be provided with the project.

Alternative B: Would not affect ecologically sensitive areas.

Alternative C: Same as Alternative B.

- **Endangered Species**

Alternative A: The study corridor did not contain any threatened or endangered species or habitat.

Alternative B: No known impact.

Alternative C: Same as Alternative B.

- **Land Acquisition and Displacement**

Alternative A: Acquisition and displacement would result from this design. The extent would depend on the level of aesthetic enhancement selected for the project.

Alternative B: There would be minimal property acquisition required and would involve commercial properties mostly located at the Grant-Kolb/Tanque Verde intersection.

Alternative C: Would not result in any land acquisition or displacements.

- **Land Use and Zoning**

None of the alternatives would affect existing land use patterns and would be consistent with existing zoning.

- **Noise**

Alternative A: The depressed portion meets the noise abatement criteria of 67 dBA. The portion in close proximity to the Pantano Estates exceeds the 67 dBA criteria, and noise mitigation would be warranted. The remaining portions meet the criteria.

Alternative B: Noise calculations indicated that the criteria of 67 dBA will be met or exceeded. If this alternative is further developed for implementation, additional analysis should be done to evaluate any predicted increases. Noise mitigation will be implemented at all areas necessary.

Alternative C: Would not significantly affect noise levels.

- **Pre-Existing Hazardous Waste**

Alternative A: Would require acquisition of a Union 76 gasoline station. An environmental audit would be required to see if seepage from storage tanks may have occurred.

Alternative B: Same as Alternative A but would involve the Chevron gasoline station at the northwest corner of Grant-Kolb/Tanque Verde.

Alternative C: Would have no impact on pre-existing hazardous waste.

- **Prime and Unique Farmlands**

None of the alternatives involve prime agricultural lands.

- **Soils and Geology**

None of the alternatives cause adverse impacts on soils and geology.

- **Traffic**

Existing and projected traffic volumes are presented in Table 2.1 of this report.

- **Visual**

Alternative A: Would alter existing visual resources within the right-of-way. The proposed roadway would not be visible from the Pantano Townhomes because it would be depressed and screened. The view from the Pantano Townhomes would change from the existing right-of-way to a smaller buffer area and wall. The buffer area would be revegetated and maintained to achieve a high visual quality. Back-ground views of the mountains would not be affected.

Alternative B: Available views would be altered from their existing condition. Mountain views would be protected although they would be blocked from the driver's view while under a grade separation. Visual quality would increase at all three intersections as a result of the proposed improvements.

Alternative C: Would not affect the existing visual resources.

- **Water Resources**

1. **Flooding**

Alternative A: Would encroach on the 100-year flood zone in the form of bridge piers and abutments, however, there would not be a significant risk or a flood hazard.

Alternative B: Would not encroach on the 100-year flood zone.

Alternative C: Same as Alternative B.

2. **Permits (Navigable Waterways)**

Alternative A: May require a permit from the U.S. Army Corps of Engineers under Section 404 of the Clean Water Act.

Alternative B: Would not require a federal permit.

Alternative C: Same as Alternative B.

3. Water Quality

Alternative A: Although crossing the Pantano Wash, the potential impact to ground water resources is expected to be minimal.

Alternative B: Would not affect water quality to any significant extent.

Alternative C: Would not affect water quality.

4. Wetlands

None of the alternatives would affect wetlands.

Temporary construction impacts anticipated for the "build" alternatives include air quality, noise, construction traffic and access, and habitat disruption. A summary of the impacts that could be caused by construction for each "build" alternative is given below.

Alternative A: Construction could have a temporary impact on local air quality due to equipment exhaust and dust pollution. There will also be some disruption to wildlife during construction. Some of these effects can be mitigated by using electrical equipment where feasible and to implement extensive dust control measures.

There will also be interference with local access, but with a well-developed maintenance of traffic plan, temporary signing, and adequate detours, this interference will be mitigated as much as possible.

Noise effects of construction equipment can be controlled by limiting construction activities to daylight hours and by requiring construction equipment to have appropriate mufflers. Noise barriers can also be installed at selected locations.

Alternative B: Similar to Alternative A except that no wildlife habitat would be involved.

Alternative C: There would be not construction impacts.

Benefits: The benefits realized by both build alternatives would be through better traffic service and reduction of air pollution. Alternative A provides more benefit than Alternative B.

MITIGATION MEASURES

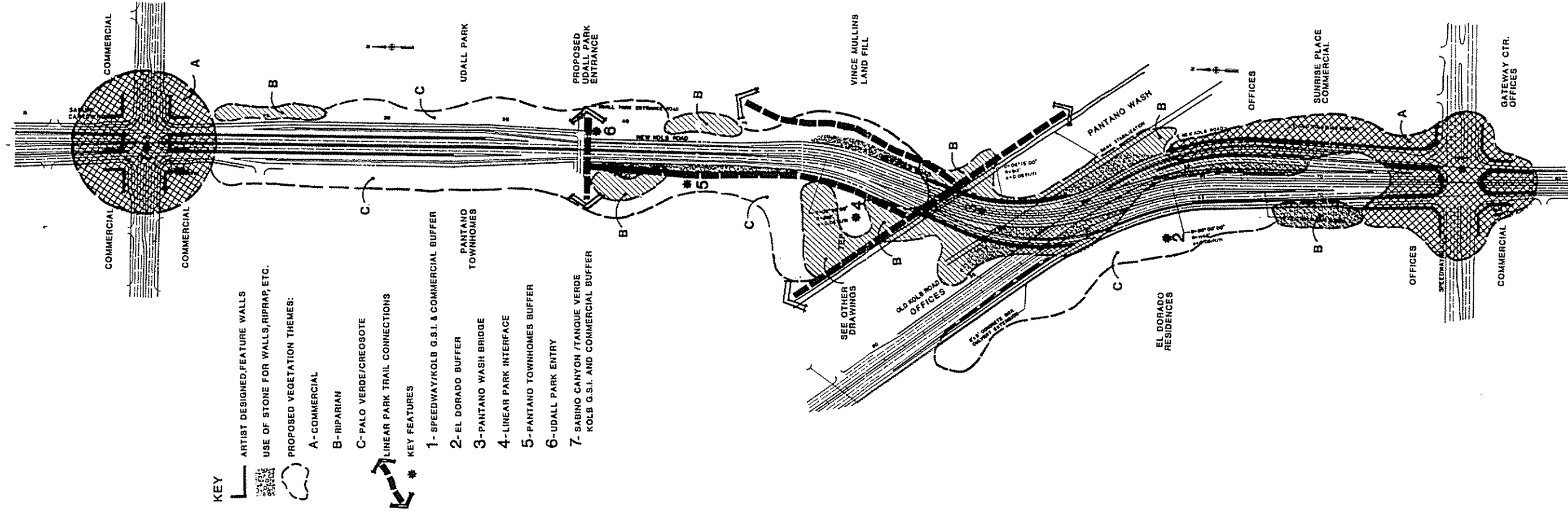
Mitigation measures for many of the environmental impacts of each "build" alternative have been identified. To develop the mitigation treatments, a landscape architect and an artist were included in the design team. Both the landscape architect and the artist collaborated on the design of the mitigation features. As a result of the artist's input, there were three levels of aesthetic treatment identified for the bridges and retaining walls involved in the two "build" alternatives.

The landscape treatment for Alternative A can be seen in Figure 5. Three landscape themes were utilized which consisted of a Commercial Theme, Riparian Theme, and Palo Verde/Creosote Theme. All plant materials called for are native and drought resistant. The low, medium, and high cost aesthetic enhancement of the structures can be seen in Figures 6, 7, and 8, respectively. Noise walls would be combined with a berm near the Pantano Townhomes, which is the only sound receptor that required noise mitigation.

Alternative B, which involves areas already urbanized, utilizes special landscape treatments at the new intersections to strengthen the visual quality. Additional screening of adjacent parking areas is recommended. Pedestrian amenities include pedestrian crossings, transit shelters, paving patterns, sidewalks, and streetscape buffer treatments. The construction of grade-separated intersections will not make a noticeable difference in the projected noise level for the areas surrounding the intersections because the roadway depression is not continuous over an appreciable distance. Additional noise studies will be required should this alternative be advanced.

PRELIMINARY COST ESTIMATES

Preliminary cost estimates were prepared for each of the "build" alternatives. Each estimate includes a "low", "medium", and "high" cost for structural enhancement to support the aesthetic treatment. Three levels of cost were also included under landscaping to reflect the artistic materials. Allowances were also included for engineering, construction administration, and contingencies. The "roadway" item includes; earthwork, pavement, barriers, traffic signals, lighting, signs, pavement markings, and striping. Provision for maintenance and protection of traffic is also included in this item. The "utilities" cost represents the cost of relocating publicly owned



KOLB ROAD EXTENSION STUDY

City of Tucson - Department of Transportation

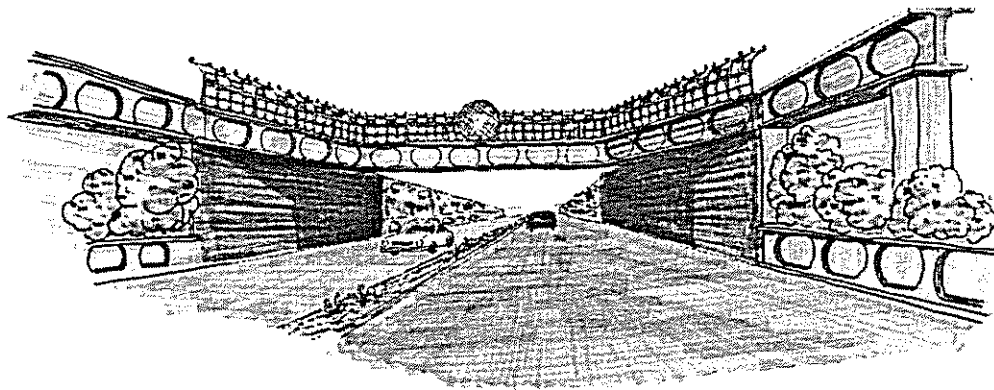
Parsons Brinckerhoff
Quade & Douglas, Inc.

Wheel &
Associates

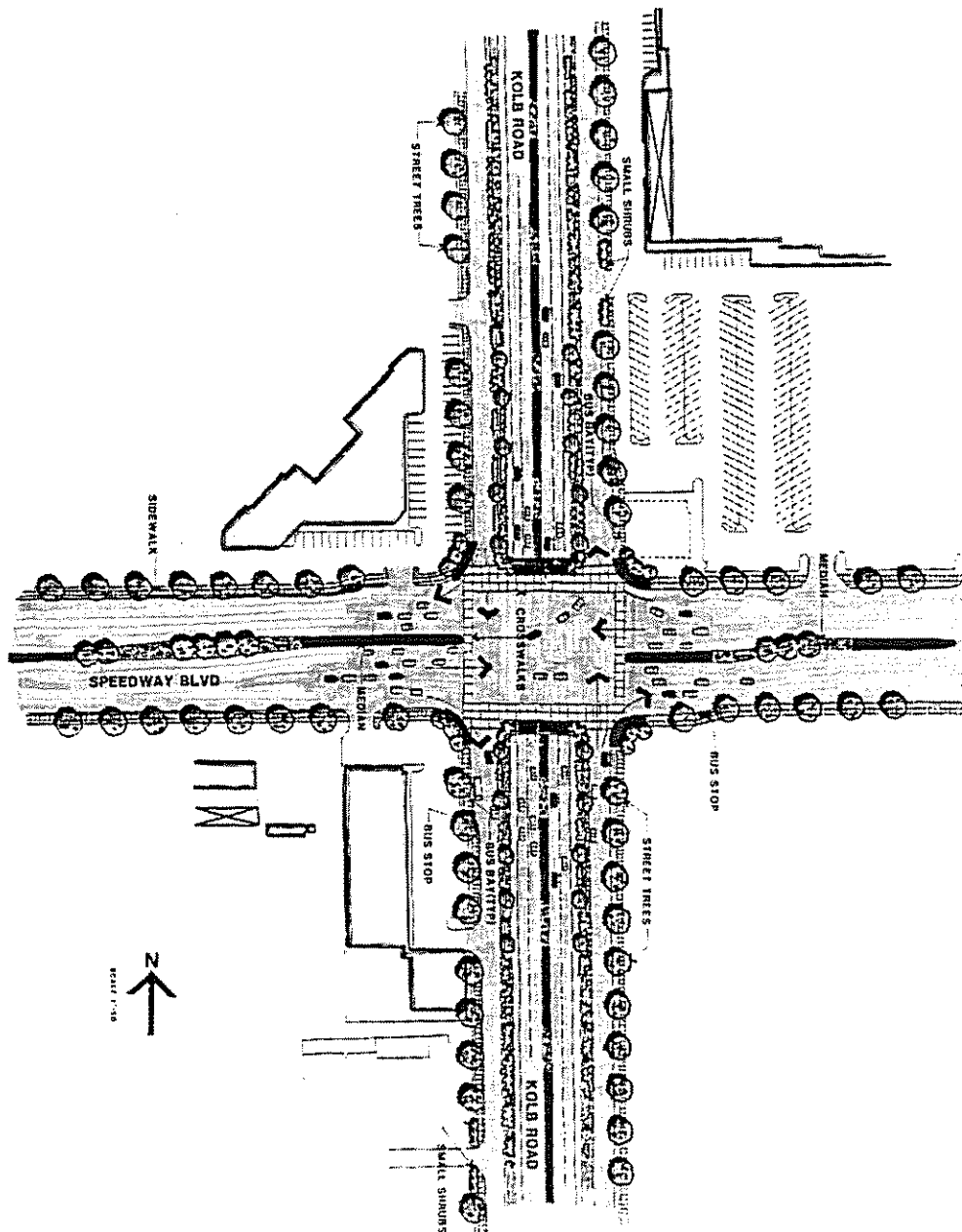
Ridillo
Consulting Group

Kolb Road Extension
AESTHETIC THEME

FIGURE 5



PERSPECTIVE



KOLB ROAD EXTENSION STUDY

City of Tucson - Department of Transportation

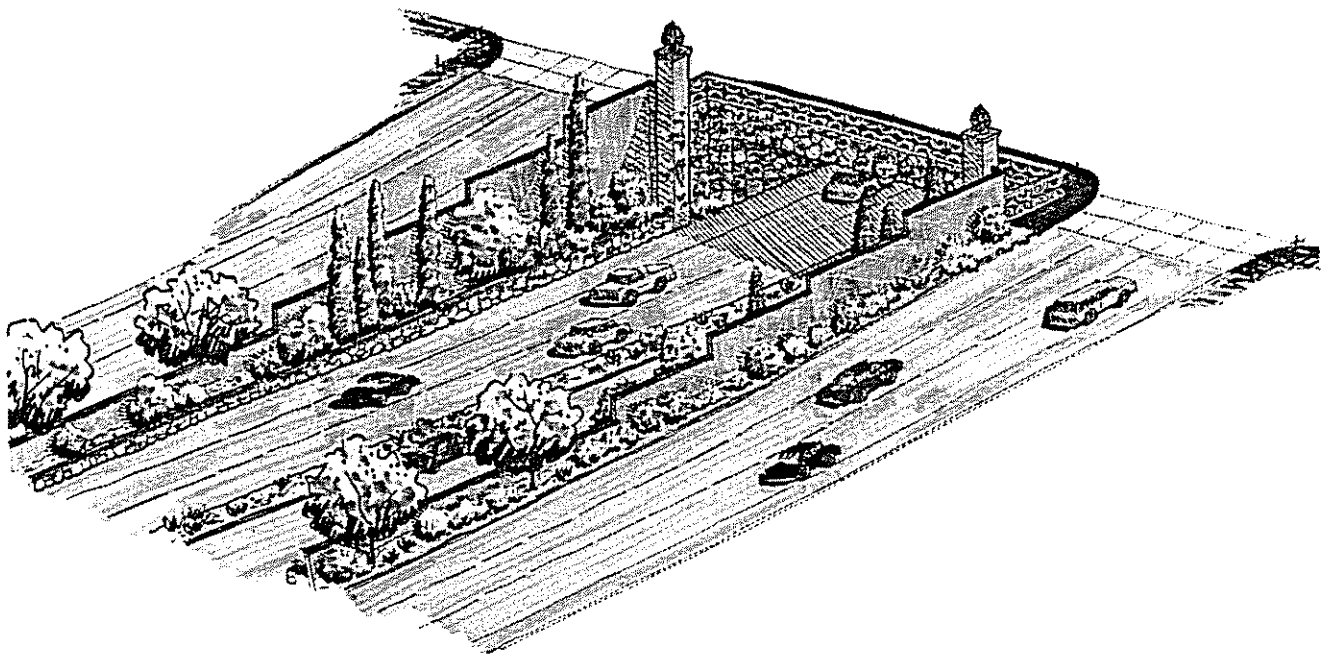
LOW COST STRUCTURAL ENHANCEMENT

Parsons Brinckerhoff
Quade & Douglas, Inc.

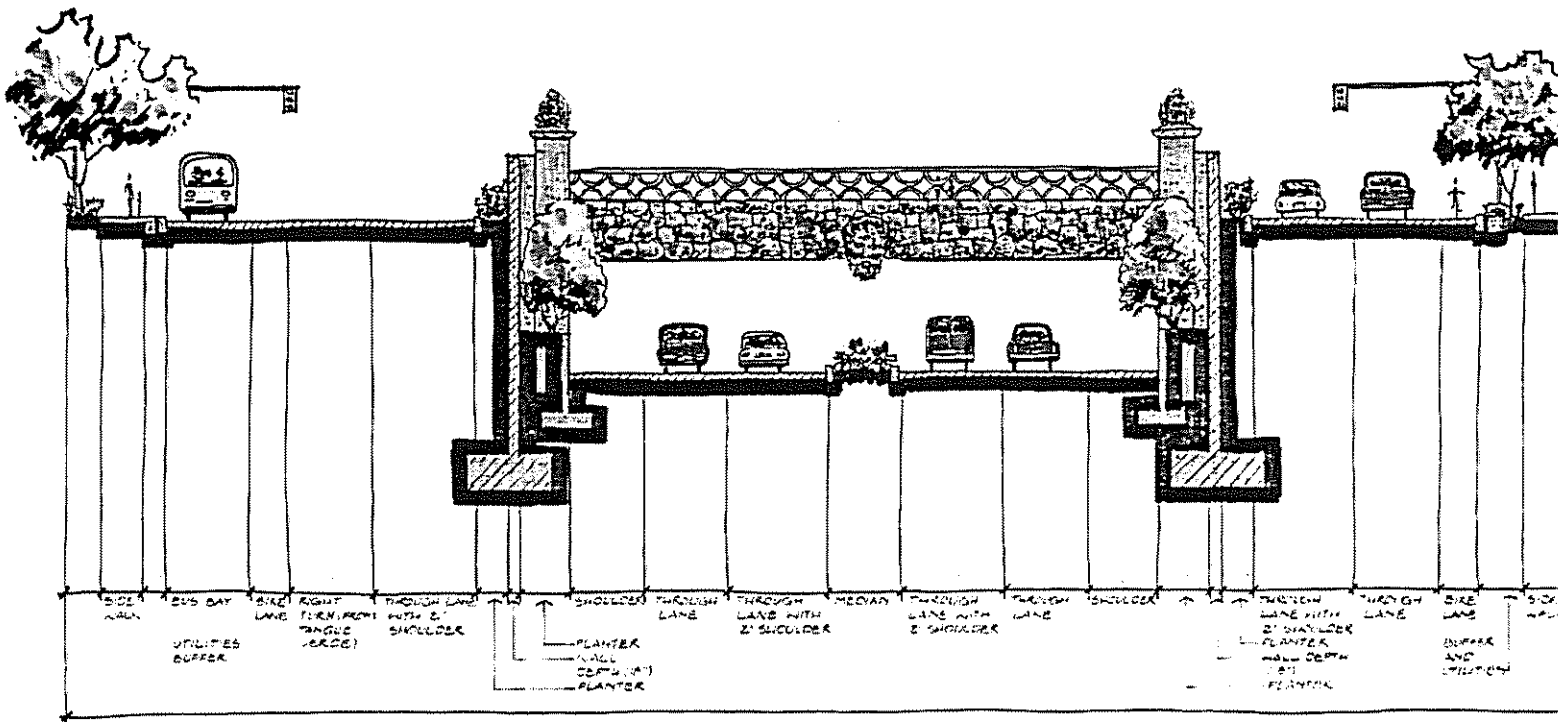
Wheat &
Associates

Rillito
Consulting Group

FIGURE 6



Isometric view looking northwest (from Udall Park)



Section A-A

SCALE: 1" = 10'

KOLB ROAD EXTENSION STUDY

City of Tucson - Department of Transportation

Parsons Brinckerhoff
Quade & Douglas, Inc.

Wheat &
Associates

Rillito
Consulting Group

MEDIUM COST STRUCTURAL ENHANCEMENT

FIGURE 7

utilities such as water and sewers. Private utilities relocations will be required but there has been no cost included in the estimate for their relocation. The right-of-way costs were based on square foot unit prices for various property types multiplied by the areas in square feet of the property types to be acquired. The preliminary project costs for each alternative is as follows:

	<u>Alternative A</u>	<u>Alternative B</u>
Low	\$55,836,000	\$33,176,000
Medium	\$64,209,000	\$34,167,000
High	\$76,831,000	\$35,342,000

EVALUATION OF ALTERNATIVES

Each of the three alternatives were evaluated against selected criteria that would allow a meaningful comparison to be made. Although some of the criteria is more significant than others, there was no "weighting" applied to the criteria. The criteria generally consisted of items associated with traffic service, geometry, hydraulics/drainage, structures, property acquisition, utilities, public transportation, emergency services, environmental impacts and mitigation treatments, and project cost.

On February 21, 1990, the CAC was asked to compare each of the alternatives against the list of evaluation criteria items. To reach a consensus with the CAC, each alternative was discussed with the CAC and each alternative was rated as to how well it addressed each of the criteria. Ratings consisted of "very well", "moderately well", and "not well".

The results of the evaluation are shown in an evaluation matrix in Figure 9. As a result of the evaluation, Alternative A was recommended by the CAC.

The CAC reaffirmed their recommendation of Alternative A - Kolb Road Extension in the August 28, 1990 CAC meeting.

KOLB ROAD EXTENSION STUDY

CITIZENS ADVISORY COMMITTEE EVALUATION SHEET		LOCATION ALTERNATIVE		
		Kolb Rd. Ext.	3 GSI	Do Nothing
		A	B	C
Traffic				
Roadway Geometry				
Hydraulics / Drainage				
Structural				
Right of Way				
Utilities				
Public Transportation / Emergency Vehicle				
Environmental Impacts				
Mitigation Measures				
Landscape Architecture				
Artist Involvement / Urban Design				
Public Meeting				
Udall Park				
Pantano Linear Park (accessibility)				
Visual for Drivers				
Visual for Pedestrians				
Aesthetic				
Air Pollution				
Adjacent Properties				
Local Neighborhoods				
Cost				

NOTE:

Evaluation is based on how well an alternative addresses the design requirements and concerns of the public. It is also based on how well an alternative will provide opportunities and reduce constraints.

SYMBOL DEFINITION

- VERY WELL
- MODERATELY WELL
- NOT WELL

KOLB ROAD EXTENSION STUDY

City of Tucson - Department of Transportation

CAC EVALUATION MATRIX

Parsons Brinckerhoff
Quade & Douglas, Inc.

Wheat &
Associates

Rillito
Consulting Group

FIGURE 9

RECOMMENDATION

Evaluation of the alternatives conducted in this study considered effectiveness in accomodating future traffic, environmental impacts, and citizen input. These factors show that Alternative A: Kolb Road Extension and Alternative B: Three Grade-Seperated Intersections both serve the 2010 traffic significantly better than Alternative C, the no build option. Alternative B provides a slightly improved level of traffic service and a greater reduction in vehicles hours traveled (VHT) over Alternative A. Alternative A provides the least vehicles miles traveled (VMT). Alternative B has fewer environmental impacts with less direct impact on adjacent neighborhoods and other sensitive land uses. Alternative A would provide better air quality due to less VMTs. Citizen input on the two alternatives was divided; whereas the CAC supported Alternative A, attendees at the public meeting preferred Alternative B.

Because neither alternative clearly outweighs the other from either a technical or public acceptance stance, constructibility of the two alternatives should be considered. The cost of Alternative A is 60-100% (depending on the option selected) higher than estimated cost of Alternative B. Alternative B can be staged to maximize available revenues (which is important since only \$7.5 million in General Obligation bonds is available). Alternative A would be more difficult to phase and cost estimates for this alternative range from eight to ten times the available bond funds.

For the reasons listed above, it is recommended that Alternative B, three grade-seperated intersections, be accepted by the Mayor and Council and be incorporated in the BAJA Project's recommended transportation plan. Because of the level of existing congestion at that location, it is recommended that priority be given to construction of a GSI at the Grant-Kolb/Tanque Verde intesection.

It is recommended that the City of Tucson undertake preliminary engineering of the Grant-Kolb/Tanque Verde GSI in order to further define costs and to generate information which may be needed for election under the Neighborhood Protection Amendment. Approval from the Pima County Bond Committee to shift the bond funds from the Kolb Road Extension to the GSI must also be obtained.

PUBLIC HEARING PROCESS AND ADOPTED RECOMMENDATIONS

In accordance with the Roadway Development Policies (Ordinance #6543), public hearings are called for at key milestones of the Kolb Road Extension Study process to identify and adopt the final recommendations.

On January 23, 1989, Mayor and Council held a public hearing on the Advance Planning Report for the subject project. In response to public comment received at that hearing, Mayor and Council requested additional information and analysis before making a final recommendation.

Staff returned to Mayor and Council during Study Session, April 17, 1989, and at that meeting, the Mayor and Council unanimously approved the Advance Planning Report for the Kolb Road Extension Study and its conclusions. The Mayor and Council also directed staff to prepare the Environmental, Design, and Mitigation report and to evaluate an additional alternative not included in the Advance Planning Report -- not building the Kolb Road Extension but constructing grade separated intersections (GSIs) at Tanque Verde/Sabino Canyon, Tanque Verde/Kolb, and Speedway/Kolb.

The Mayor and Council held a public hearing to receive official public comment on the completed ED&MR on November 26, 1990. Upon considering the public comment

received, the Mayor and Council unanimously chose to approve Alternative C, the "No Build Option." The Mayor and Council further directed staff to meet with Pima County to discuss alternatives for use for the Pima County bond money.

Staff returned to the March 18, 1991 Mayor and Council study session. At this meeting Mayor and Council voted unanimously to accept the recommendation of staff to continue the Kolb Road Extension Study as follows:

Proceed with the design and construction of "Transportation System Management" style improvements balanced with pedestrian safety improvements and alternative modes improvements at the intersections of Speedway Boulevard and Kolb Road, Kolb Road and Tanque Verde Road, and Tanque Verde and Sabino Canyon Road utilizing the 1986 Pima County bond funds when they become available.

Support the improvement of Sabino Canyon Road from Cloud Road to just north of River utilizing the 1986 Pima County bond funds.

